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| 10/582,085 | 06/08/2006 | Atsuhiko Kawamoto | 2006_0701A | 1787 |
| 52349 7590 03/03/2011 WENDEROTH, LIND & PONACK L.L.P. 1030 15th Street, N.W. Suite 400 East Washington, DC 20005-1503 | | | | |
| EXAMINER | | | | |
| JENNISON, BRIAN W | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/582,085

Applicant(s)

KAWAMOTO ET AL.

Examiner

BRIAN JENNISON

Art Unit

3742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 6-14 and 16-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2, 6-8, 10-14, 16-21 is/are rejected.
- 7) ☒ Claim(s) 3 and 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-945)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 6, 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stava (US 6,501,049) in view of Oku (US 3,376,473) and in further view of Shintani et al (US 6,255,618) and Stave (US 5,001,326).

Stava teaches:

Regarding Claim 1: Fig 1 shows a pulse arc welding method with a current peak shown in Fig 3 at 124 and a base before time 102. See Column 5, Lines 24-40.

A short is detected at time 102 between the molten ball and base material. A current gradient is applied at time 110a in Fig 3. 110c shows the current decreasing on detecting a neck before short circuit recovery. See Column 5, Lines 24-40. The gradient is always controlled based on time since the definition of gradient for current is di/dt .

Therefore if the time of the short circuit is changed the gradient is changed. The current may be controlled. If the current during the short circuit period is increased the gradient of the current will also increase since the change in current over the change in time (the short circuit period kept the same) will increase the gradient of the current. See Column 2, Lines 5-45. Furthermore, time during the short circuit period is a variable "t" which is

indicative of an increase or decrease in current based on the desired operating parameters.

Stava fails to teach:

Regarding Claim 1: the longer the time elapsed the greater the gradient, storing a relationship between a lapse of time from a short circuit of the welding wire and the welding base material and a gradient of the welding current, the gradient being smaller than a gradient at a pulse rise of a current waveform of the pulse;

Oku teaches:

Regarding Claim 11: The gradient of the current is varied. See Column 4, Lines 1-5. Adjusting the output characteristics can easily be obtained by adjusting the circuit conditions. Persons having no ordinary skill in the art may easily adjust the welding conditions which include current gradient and elapsed time. See Column 4, Lines 1-25.

In view of the teachings of Oku it would have been obvious to one of ordinary skill in the art at the time of the invention to include with the teachings of Stava, increasing the gradient of the current since Oku teaches varying the gradient of the current for arc stabilization during the short period.

Shintani discloses regarding claim 1, the gradient is stored in storage portion 136 at different time periods which indicates a lapse in time is also stored since there is a lapse

between the time periods. (See Column 13, Line 55-Column 14, Line 12) It would have been obvious to adapt Stava as modified by Oku in further view of Shintani to provide the gradient and time lapse storing for calculating a filler feed rate according to the gap size.

Stava ('326) discloses regarding claim 1, the current, as shown in Fig 4, decreasing vertically but does not drop below a predetermined limit or below the base current. (See Column 9) It would have been obvious to adapt Stave in view of Stava '326 to provide the decreasing of the welding current to fall vertically to a first current not smaller than a lower limit for transferring the metal to the weld pool.

Stava also teaches:

Regarding Claim 2: Fig 3 shows the current increased at 122 after the neck and after the current has been decreased at 110c.

Regarding Claim 14: Fig 3 shows the current decreasing at 102 when the short circuit begins and the gradient would be smaller than the gradient at the pulse rise See Column 5, Lines 30-50 and Column 4, Lines 40-45.

Regarding Claim 6: Fig 3 shows an output voltage being detected. The gradient between 110a and 110b is capable of being controlled based upon V_{out} .

Regarding Claim 16: The length of time elapsed from the short circuit is easily obtained. See Column 4, Lines 50-55. The gradient is controlled based on the time elapsed since the gradient will increase more as the elapsed time increases since the current is being increased during this time. See Fig 3. The greater the time elapsed the greater the gradient since the current is increased more as time progresses.

3. Claims 7-8, 10 and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai (JP 01-266966) as cited by applicant. References made to machine translation of equivalent document JP 2563465 in view of Shintani et al (US 6,255,618) and Stave (US 5,001,326).

Kawai teaches:

Regarding Claim 7: Drawing 2 shows a pulse arc welding circuit with a switching element 17 which controls the current output. A welding current value detector 11 for control output current. A welding voltage value detector 12 for controlling output voltage. A short circuit decision circuit 13 judges if the welding state is in short circuit or arc period. Control circuit 14 defines a parameter. Pulse shape circuit 15 controls the pulse output. Control circuit 14 also controls the dip pulse of the waveform. See Page 3. Switch element 163 decreases and increases the current. See page 7. Driving circuit 18. The control circuit is capable of producing a welding current having a gradient smaller than the gradient at a pulse rise of a current waveform since the structure for

changing the current exists in the circuit. The current also falls vertically upon the neck, since it drops.

Kawai fails to disclose regarding claim 7, wherein the setting section stores a relationship between a lapse of time from a short circuit of the welding wire and the welding base material and a gradient of the welding current. Shintani discloses regarding claim 7, the gradient is stored in storage portion 136 at different time periods which indicates a lapse in time is also stored since there is a lapse between the time periods. (See Column 13, Line 55-Column 14, Line 12) It would have been obvious to adapt Stava as modified by Oku in further view of Shintani to provide the gradient and time lapse storing for calculating a filler feed rate according to the gap size.

Stava ('326) discloses regarding claim 7, the current, as shown in Fig 4, decreasing vertically but does not drop below a predetermined limit or below the base current. (See Column 9) It would have been obvious to adapt Stave in view of Stava '326 to provide the decreasing of the welding current to fall vertically to a first current not smaller than a lower limit for transferring the metal to the weld pool.

Regarding Claim 8, The switching element 163 is capable of decreasing the current before the recovery from short circuit as shown in Fig 5. See Page 7.

Regarding Claim 10: The time is monitored in a section of the circuit by logic elements and is capable of controlling the gradient of the current. Fig 5 shows current I_a having an increase over a time period.

Regarding Claim 12: The output voltage is used for the pulse shape circuit part which can control the gradient. See Page 5.

Regarding Claim 13: Fig 5 shows a lower limit of the welding current.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai as modified by Shintani and Stava '326 and in further view of Oku (US 3,376,473).

Kawai as modified fails to teach:

Regarding Claim 11: the setting section performs output control so as to increase a steepness of the gradient of the current waveform in the short-circuit condition as the length of time elapses from the short circuit increase.

Oku teaches:

Regarding Claims 5 and 11: The gradient of the current is varied. See Column 4, Lines 1-5. Adjusting the output characteristics can easily be obtained by adjusting the circuit conditions. Persons having no ordinary skill in the art may easily adjust the welding conditions which include current gradient and elapsed time. See Column 4, Lines 10-25.

In view of the teachings of Oku it would have been obvious to one of ordinary skill in the art at the time of the invention to include with the teachings of Kawai as modified, increasing the gradient of the current since Oku teaches varying the gradient of the current for arc stabilization during the short period.

Allowable Subject Matter

4. Claims 3 and 9 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
5. The following is a statement of reasons for the indication of allowable subject matter: None of the prior art of record shows or fairly suggested the claimed invention as a whole having the welding current is decreased to a second current not smaller than a second predetermined lower limit...the welding current is maintained at the second current for a predetermined period by carrying out constant current control.

Response to Arguments

6. Applicant's arguments with respect to claims 1 and 7 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRIAN JENNISON whose telephone number is (571)270-5930. The examiner can normally be reached on M-Th 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, TU HOANG can be reached on 571-272-4780. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BRIAN JENNISON/
Examiner, Art Unit 3742

2/24/2011

/Mark H Paschall/
Primary Examiner, Art Unit 3742